

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-29. (Cancelled)

30. (New) A device for detecting energy generated by non-radiative decay in an analyte or a complex or derivative of the analyte on irradiation with electromagnetic radiation comprising a radiation source adapted to generate a series of pulses of electromagnetic radiation,  
a transducer having a pyroelectric or piezoelectric element and electrodes which is capable of transducing the energy generated by the substance into an electrical signal,  
at least one reagent proximal to the transducer, the reagent having a binding site which is capable of binding the analyte or the complex or derivative of the analyte, and  
a detector which is capable of detecting the electrical signal generated by the transducer,  
wherein the detector is adapted to determine the time delay between each pulse of electromagnetic radiation from the radiation source and the generation of the electric signal.

31. (New) A device as claimed in claim 30, wherein the reagent is an antibody and the analyte is an antigen.

32. (New) A device as claimed in claim 31, wherein the complex or derivative of the analyte is a complex with a labelled antibody.

33. (New) A device as claimed in claim 31, wherein the analyte is a labelled antigen and the electrical signal detected by the detector is inversely proportional to the presence of an unlabelled antigen in the sample.

34. (New) A device as claimed in claim 32 or 33, wherein the labelled antibody or antigen is labelled with a label selected from a dye molecule, a gold particle, a coloured-polymer particle, a fluorescent molecule, an enzyme, a red blood cell, a haemoglobin molecule, a magnetic particle and a carbon particle.

35. (New) A device as claimed in claim 30, wherein the reagent is a first nucleic acid and the analyte is a second nucleic acid and the first and second nucleic acids are complementary.

36. (New) A device as claimed in claim 30, wherein the reagent contains avidin or derivatives thereof and the analyte contains biotin or derivatives thereof, or vice versa.

37. (New) A device as claimed in claim 30, wherein the time delay is at least 5 milliseconds.

38. (New) A device as claimed in claim 37, wherein the time delay is at least 10 milliseconds.

39. (New) A device as claimed in claim 30, wherein the time delay is no greater than 500 milliseconds.

40. (New) A device as claimed in claim 39, wherein the time delay is no greater than 250 milliseconds.

41. (New) A device as claimed in claim 39, wherein the time delay is no greater 150 milliseconds.

42. (New) A device as claimed in claim 30, wherein the electromagnetic radiation is light.

43. (New) A device as claimed in claim 30, wherein the reagent is adsorbed on to the transducer.

44. (New) A device as claimed in claim 30, wherein the analyte is dissolved or suspended in a liquid.

45. (New) A device as claimed in claim 44, further comprising a well for holding the liquid in contact with the transducer.

46. (New) A device as claimed in claim 30, further comprising a chamber for storing one or more additional reagents.

47. (New) A device as claimed in claim 46, wherein the additional reagent is a labelled antibody for producing the subsequently formed complex or derivative of the analyte.

48. (New) A device as claimed in claim 30, wherein the frequency of the pulses of electromagnetic radiation is at least 2 Hz.

49. (New) A method for detecting an analyte in a sample, comprising the steps of exposing the sample to a transducer

having a pyroelectric or piezoelectric element and electrodes which is capable of transducing a change in energy to an electrical signal, the transducer having at least one reagent proximal thereto, the reagent having a binding site which is capable of binding the analyte or a complex or derivative of the analyte, the analyte or the complex or derivative of the analyte being capable of absorbing the electromagnetic radiation generated by the radiation source to generate energy by non-radiative decay;

irradiating the reagent with a series of pulses of electromagnetic radiation,

transducing the energy generated into an electrical signal;

detecting the electrical signal and the time delay between each pulse of electromagnetic radiation from the radiation source and the generation of the electric signal, wherein the time delay between each of the pulses of electromagnetic radiation and the generation of the electric signal corresponds to the position of the analyte at any of one or more positions at different distances from the surface of the transducer.

50. (New) A method as claimed in claim 49, wherein the reagent is an antibody and the analyte is an antigen.

51. (New) A method as claimed in claim 50, wherein the complex or derivative of the analyte is a complex with a labelled antibody.

52. (New) A method as claimed in claim 50, wherein the analyte is a labelled antigen and the electrical signal detected by the detector is inversely proportional to the presence of an unlabelled antigen in the sample.

53. (New) A method as claimed in claim 51 or 52, wherein the labelled antibody or antigen is labelled with a label selected from a dye molecule, a gold particle, a coloured-polymer particle, a fluorescent molecule, an enzyme, a red blood cell, a haemoglobin molecule, a magnetic particle and a carbon particle.

54. (New) A method as claimed in claim 49, wherein the reagent is a first nucleic acid and the analyte is a second nucleic acid and the first and second nucleic acids are complementary.

55. (New) A method as claimed in claim 49, wherein the reagent contains avidin or derivatives thereof and the analyte contains biotin or derivatives thereof, or vice versa.

56. (New) A method as claimed in 49, wherein the method is carried out without removing the sample from the transducer between the steps of exposing the sample to the transducer and irradiating the reagent.

57. (New) A method as claimed in claim 49, wherein the frequency of the pulses of electromagnetic radiation is at least 2 Hz.